Transplant patients. The University of Kansas Outpatient Blood and Marrow Transplant Program has undertaken a Quality Improvement Retrospective Project utilizing Palliative Care in the outpatient setting, to proactively address these chronic issues. Retrospective analysis suggests implementation of early Palliative Care in this patient population improves quality of life, while reducing costly in-patient, end of life care.

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Feasibility of Cardiopulmonary Exercise Testing and Longitudinal Patient-Reported Outcome (PRO) Assessment in Patients Undergoing Hematopoietic Cell Transplantation

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Background: Hematopoietic Cell Transplantation (HCT) is a potentially curative therapy for high risk malignancies but remains limited by treatment-related toxicity. Pre-HCT cardiopulmonary exercise testing and longitudinal post-HCT patient-reported outcome (PRO) surveillance are new techniques that may help to predict risk and tailor interventions to improve long term outcomes.
Patients and Methods: We performed a feasibility study enrolling 32 patients into three cohorts (10 autologous HCT recipients, 11 full intensity allogeneic HCT recipients, and 11 reduced intensity allogeneic HCT recipients). Pre-transplant physiological measurements included VO_{2peak} assessment by cycle ergometer and 6-minute walk testing (6MWT). PRO measurements included daily and weekly symptom inventories derived from the NCI's PRO-CTCAE, and weekly HRQOL assessments using the NIH's PROMIS Global Health measure. Spearman correlation coefficients, Wilcoxon Signed Rank tests, and univariable Cox regression models were used to determine the associations of variables with each other and with outcomes.
Results: Median age at the time of transplantation was 57.6 years. Eighty-one percent of patients had intermediate or advanced disease and 41% had a high school education or lower. Pre-defined feasibility criteria for enrollment (>60%) and data collection were achieved. Ninety-one percent of patients completed VO_{2peak} and 6MWT prior to HCT. Ninety-four percent of patients opted to use the electronic mode of survey assessments. Weekly symptom surveys were completed in a median of 4.3 minutes, and weekly HRQOL surveys were completed in a median of 3 minutes. The median weekly completion rate was 100% in all cohorts from the start of conditioning through hospital discharge. VO_{2peak} was positively correlated with 6MWT (r=0.65, $P < .001$) and negatively correlated with months of prior chemotherapy (r=-0.43, $P = .03$), and was not correlated with age or HCT-CI. A VO_{2peak} >16mL/kg*min (N=21/29) was associated with a decreased risk of mortality after HCT (HR 0.11 (0.02-0.59), $P = .001$). Patients with VO_{2peak} ≤16mL/kg*min had higher overall symptom scores and worse physical and mental HRQOL at baseline and throughout the period of observation than patients with VO_{2peak} > 16mL/kg*min. In general, symptoms were correlated with physical and mental HRQOL. Individual symptoms differed in frequency and severity by cohort and by time point, in clinically expected ways. Statistically significant differences were seen when comparing all three cohorts by overall symptom scores and by physical and mental HRQOL.
Conclusions: Pre-HCT cardiopulmonary exercise testing and post-HCT longitudinal PRO surveillance are feasible, meaningful, and potentially prognostic. These techniques should be explored further in larger studies.

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Symptom Burden in Long-Term Hematopoietic Cell Transplantation (HCT) Survivors

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Introduction: HCT survivors are at risk of elevated symptom burden. We examined demographic and treatment factors that might predict six long-term symptoms: cancer-related distress, depression, insomnia, fatigue, pain, and physical limitations.
Method: Four invitations to participate were sent by email to HCT survivors on the BMT InfoNet listserve, a patient resource and advocacy site. Eligibility criteria included >18 years old, more than two years post-HCT, without a recurrence or second cancer in the prior two years, without severe depression, able to communicate in English, and with internet and email access. Measures were the Cancer and Treatment Related Distress scale, the Symptom Checklist-90-R depression, the Insomnia Symptom Questionnaire, the Fatigue Symptom Inventory, the Brief Pain Inventory, and the Short Form-36 physical function scale. Standardized cutoffs were used for each measure to determine if participants had symptoms. A sum was computed for a potential range of scores (0-6).
Results: Of 493 registered survivors, 386 (78%) were eligible. Participants were from the U.S. (94%, N=361) and 12 other countries, treated at 136 centers, largely Caucasian and non-Hispanic (95%), on average 9 years post-HCT (SD=6, range 2-33); 70% received allogeneic HCT, 20% were receiving treatment for chronic graft versus host disease (cGVHD). Mean age was 54 (SD=12, range 19-76). Participants with elevated scores on at least one symptom comprised just over half of the sample (57%) and 27% reported 3 or more symptoms (N=105). The least commonly endorsed symptom was

pain (11%) and the most common was fatigue (41%) with the other four symptoms in the 24-26% range. Multivariate logistic regression was used to analyze predictors with a cutoff of >3 symptoms. Participants currently on medication for cGVHD (OR=2.32, $P = .003$) and females (OR=1.72, $P = .04$) were more likely to report 3 or more symptoms. There was a reduced likelihood of reporting 3 or more symptoms for every 5 years post-treatment (OR=.72, $P = .008$) and for participants with incomes more than $60,000 per year (OR=.59, $P = .04$).

Discussion: Risk for long-term symptoms after HCT was associated with ongoing cGVHD treatment, being female, as well as shorter time since transplant and lower income. Future research needs to examine how treatment and demographic factors interact as either risk or protective factors for symptom burden and identify strategies to reduce symptoms.

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Risk Factors for Dry Eye After Hematopoietic Stem Cell Transplantation

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Design: Case control analytic study

Objectives: To investigate risk factors for developing dry eye in adult patients after hematopoietic stem cell transplantation (HSCT). Secondarily, to assess severity of dry eye and tear profiles in these patients.

Methods: This study was conducted from May 2011-June 2012. Seventy-eight adult patients who underwent HSCT for various hematologic disorders at King Chulalongkorn Memorial Hospital were enrolled in this study. Two patients were excluded due to underlying lid abnormalities that might cause dry eye. Dry eye was diagnosed using standardized questionnaire, tear break-up time, Schirmer test and fluorescein and rose bengal staining. Of 76 patients, 40 patients (52.6%) had dry eye and they served as the case group. Thirty-six patients who did not meet the criteria served as the control group. Patient's charts were reviewed for clinical data, HSCT details and complications. The main outcome measures were dry eye occurrence, severity and tear profiles.

Results: 24 of 48 patients (50%) who received allografts and 16 of 28 patients (57.1%) who received autografts had dry eye after HSCT. Peripheral blood was used as stem cell source in 96% of the patients. Dry eye manifestation was found to be positively correlated with age over 35 years, duration of systemic cyclosporine use and chronic graft-versus-host disease (GVHD) of the oral cavity ($P = .049$, $P = .010$ and .002 respectively, by univariate analysis). Using binary logistic regression, we found only chronic oral GVHD to be strongly associated with dry eye occurrence ($P = .006$, odds ratio= 9.15, 95% CI 1.91-43.87). Fluorescein and rose bengal staining were classified in significantly higher grading in allogeneic than the autologous group ($P < .001$ and $P = .007$ respectively, Mann-Whitney Test). Of 18 patients who had severe dry eye, 13 (72.2%) were in allogeneic and 5 (27.8%) were in autologous group.

Conclusion: Dry eye is a very common ocular manifestation after autologous and allogeneic HSCT, albeit more severe in allogeneic HSCT. In allogeneic transplant patients, close attention to the development of chronic oral GVHD may lead to early diagnosis of dry eye in these patients.

POSTER SESSION 1: LEUKEMIA

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Long-Term Remission After Allogeneic Stem Cell Transplantation in Acute Myeloid Leukemia Patients with Active Disease

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Between 1994 and 2011 343 adult patients with acute myeloid leukemia (AML) underwent allogeneic stem cell transplantation (SCT). 244 pts were transplanted in CR 1, CR 2 or CR 3 and 99 pts were transplanted with active disease. 56/99 pts were male, 43/99 pts were female. Median age was 50 years (17 – 70). 65 pts had primary AML, 22 pts secondary AML after MDS and 12 pts had therapy related (t-AML). 45/99 pts had induction failure (primary refractory), in 3/99 pts AML was untreated (Fanconi, SCID, active NHL), 39/99 pts were transplanted for AML in first relapse and 12/99 pts were transplanted for AML in second relapse. Median blast count in the bone marrow before conditioning was 20 % (5 – 90). 21 pts had extramedullary leukemia, mainly meningeosis and skin involvement. Karyotype was intermediate in 60 pts and high risk in 33 pts. In 5 pts karyotype analysis was not done, in 1 patient favourable. Induction failure was defined as blast persistence after two cycles of chemotherapy including high dose ARAC. Pts transplanted in first relapse had an untreated relapse (n = 15) or had received another chemotherapy. Pts with meningeosis had received intrathecal therapy. Donors for SCT were HLA identical siblings in 35/99 pts or unrelated donors in 64/99 pts. Conditioning regimen was myeloablative (MAC) (12 Gy TBI + CY) in 42 pts (since 1995), reduced intensity conditioning (RIC) (FLU/ BU/ATG) in 42 pts (since 1998) and FLAMSA-RIC in 15 pts (since 2007).

Results: After allogeneic SCT 4/99 pts had progression of leukemia, 95/99 went in remission. 24/99 pts are alive, 4 with AML and 20 pts in CCR. Median remission duration of the 20 pts in CCR is 47 months (0.5 - 130). 75/99 pts are dead. Causes of death are leukemia in 48/75 and TRM in 27/75 pts, mainly gvhd and infection. Probability of survival at 60 months, 90 months and 120 months for the whole group is 0.26, 0.19 and 0.08, respectively. The stage of disease at conditioning had no significant influence. Probability of survival at 60 months and 90 months for primary refractory pts was 0.3 and 0.22, in first relapse 0.26 und 0.13 and in second relapse 0.19 and 0.19. The conditioning regimen was not randomized and showed a trend for better survival in RIC vs. MAC vs. FLAMSA RIC, at 60 months 0.42 vs. 0.17 vs. 0.1 (at 30 months), at 90 months 0.25 vs. 0.14.

Conclusion: After induction failure or after first relapse SCT is the only curative therapy. About 25% of the pts can enjoy